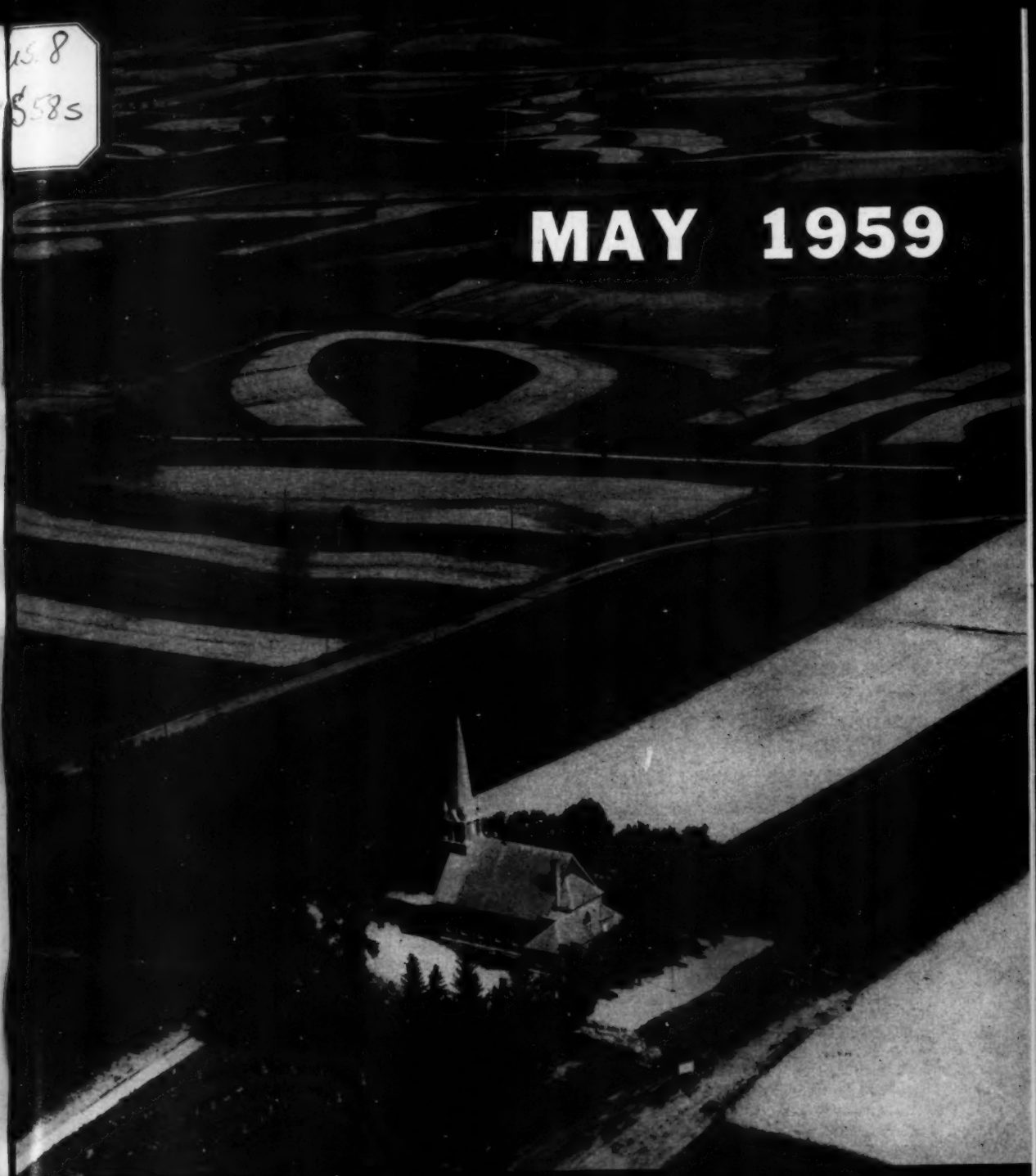

MAY 1959

SOIL CONSERVATION

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EZRA TAFT BENSON
SECRETARY OF AGRICULTURE

DONALD A. WILLIAMS
ADMINISTRATOR, SOIL CONSERVATION SERVICE

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE
U. S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

★ THIS MONTH ★

TOM DALE, Editor

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication has been approved by the Bureau of the Budget, June 26, 1958. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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FUTURE NEEDS FOR SOIL AND WATER CONSERVATION.—During the past year the population of the United States passed the 175 million mark. The Census Bureau has raised its estimate for population by 1975 to 244 million. Some experts are predicting that the present population may be doubled by the year 2,000.

Can our land resources be made to feed, clothe, and house twice the present number of people? We believe they can, provided our good agricultural land is used for that purpose and is protected and improved, and our water resources are more efficiently used. Obviously, the future needs for soil and water conservation are tremendous.

—D. A. WILLIAMS, *Administrator, Soil Conservation Service*

Editors are invited to reprint material originating in this magazine.

FRONT COVER.—A rural church in a conservation farming community of Pepin County Soil Conservation District, Wis.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Modernizing Snow Surveys

Two-way Radios Are Rapidly Being Adopted for Communications Between Snow Survey Parties and Their Base Stations. Electronic Measuring Devices Are Being Considered as Substitutes for Snow Surveyors.

By W. G. SHANNON

SNOW business is big business, especially when you are trying to measure accurately the amount of moisture in all the snow that falls on the mountain ranges of nearly half a continent. Like any other business, snow surveying should keep abreast of modern times. The time is overdue for using the full potential offered by electronics and other modern scientific developments to further the cause of water supply forecasting.

A vast network of snow survey courses exists in the Western States and parts of southwestern Canada. These courses, for the most part, are located in high mountain areas where snowfall is abundant.

The Soil Conservation Service, with many agencies and organizations cooperating, provides the leadership in obtaining snow survey and soil moisture information from the mountains. This information is used in preparing forecasts of probable water supplies during the snowmelt-runoff period.

The increasing demand for advance information on potential water supplies requires a greater use of recent scientific developments and procedures to keep pace with the demand.

Falling snow doesn't mean much for forecasting purposes unless it is known where it falls and how much falls. The snow surveyor obtains this information. Most people have experienced the hazards involved in driving on icy or snow-covered roads. It is not too difficult to visualize what travel may be like for the snow surveyor in the rugged western mountains in midwinter. The volume of information that can be economically obtained under these conditions by direct measurement of snow by surveyors is limited.

The snow surveyor has several modes of travel—on ski or snowshoes, in automobiles, over-snow machines, or by airplane. The mode of travel is set by the location of the snow course; and the location, in turn, depends on the need for representative snow information from a particular area.

To meet the challenge of the mountains, it has been necessary to provide the best of training to people making snow measurements. Training schools are regularly scheduled for this purpose. Snow surveyors receive instruction in mountain survival, safety and health,

Snow surveyors assemble their equipment to take snow samples and measure the water content.

Note:—The author is a civil engineer, Soil Conservation Service, Washington, D. C.

use of skis and snowshoes, operation of over-snow machines, and survey methods and procedures for sampling snow.

The use of airplanes is by contract with commercial firms. To date, the use of airplanes has not been very successful. Landing in the snow is hazardous, and reading snow depths from the air does not provide an accurate estimate of the water content of the snow.

In some places the snow courses are located adjacent to improved roads and can be reached by car. But these are exceptions and not the rule. Over the years, various kinds of over-snow machines have been developed. Most have proven inadequate for mountain travel. A few types are being used today for over-snow travel in the mountain areas. Even with the best of these, the snow surveyors are confronted with frequent breakdowns, often miles from the nearest help. Under these condition, they either make their own repairs or travel "out" on snowshoes or skis.

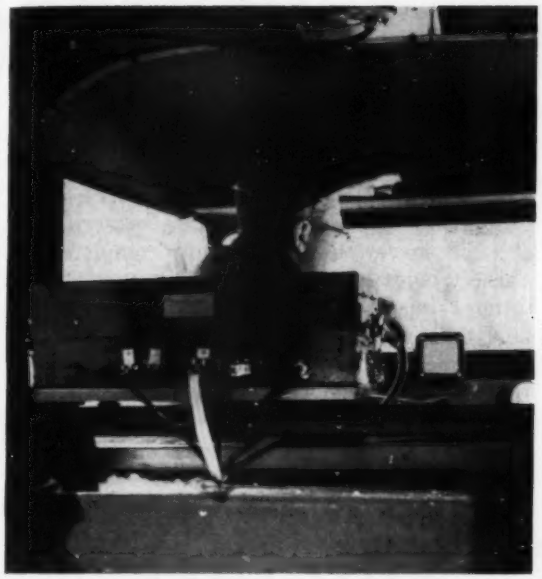
The foregoing discussion points up the need for two things: (1) a simpler and less hazardous means of making snow surveys; and, (2) a reliable means for the snow surveyor to maintain communication contact with a base station.

Considerable effort is being put into an economical and practical solution of this first problem. This involves using electronic devices for the measurement of water equivalent and other data at remote mountain locations and the transmission of these data to a base receiving and recording station. It will probably be some time, however, before simple and economical equipment can be developed that will meet these requirements.

Steps have already been taken to overcome the second problem. Commercial two-way radio communication equipment is available, which will work satisfactorily under snow survey conditions. However, there are many problems associated with its use.

The Interdepartment Radio Advisory Committee has established rules and regulations for the use of frequencies and radio communication

Over-snow machine equipped with two-way radiotelephone.



Radiotelephone equipment in an over-snow machine. The equipment is so installed that it is clear of gas-tank, passengers, and antenna.

equipment by Federal agencies. These rules and regulations, in general, follow those prescribed by the Federal Communications Commission.

Establishing two-way radio communication for use in Soil Conservation Service over-snow machines requires approval for an operating frequency; location or area of operation; type of emission; call sign; and maximum power. Frequencies may be assigned in the low frequency band, high and very high frequency bands, and in the ultrahigh frequency band. Each of these bands has different characteristics which must be considered when establishing two-way radio communication. In general, it is difficult to communicate out of deep mountain valleys or ravines without the use of relay stations installed on mountain knobs or peaks.

In the mountain States, numerous networks employing relay stations have been established by various agencies. The Soil Conservation Service has been fortunate in being able to tie into some of these existing systems. In Arizona our operators are able to keep in radio contact with the law enforcement agencies' network. In Nevada, they operate with the State forestry radio network. The U. S. Forest Service has been most cooperative in allowing a "tie-in" with some of their forest networks. This arrangement is working in Idaho, Montana, and Utah. Then there are areas requiring separate base and mobile stations operating independently of any existing network.

Radio communication equipment is being installed in over-snow machines and at other specified locations to: (1) provide current information on the location and progress of over-snow machines and condition of personnel; (2) expedite repairs to machines enroute to or from snow courses; (3) transmit snow course information faster; and, (4) provide a means of obtaining snow course data from ranchers or others located in remote areas, thereby eliminating the need for a trip to the snow course from the "outside."

The McCauley ranch in the Black Mountains in New Mexico is one such location. The nearest post office is about 70 miles away and must be reached over a treacherous mountain road impassable in bad weather. Only a jeep can maneuver parts of the road without damage even in good weather. Inhabitants in the area are few and far between. Travel into the snow course area with an over-snow machine would be long and costly. At times the rancher could measure the snow courses but could not get the information to the nearest post office at the

Snow surveyor (Richard Funke) calls the nearest relay station to report the results of his survey and say that all is well.

town of Truth or Consequences. The installation of a two-way radio set solved this problem. The information is now transmitted to a forest ranger station, which relays the information by radio to Silver City, N. Mex.

There are many situations where the two-way radio equipment will provide benefits, aside from its emergency uses in case of accident or danger to life. One such situation developed in the rough mountain area of Idaho. Some exceptionally long trips are required by over-snow machines to obtain information on snow cover conditions in this State. On one of these trips one track of the over-snow machine broke under strain. Normally, under these conditions, the snow surveyor and his companion would have to strap on snowshoes or skis and a back pack and travel out of the mountains on foot over the snow. There is always the possibility of avalanches, accidents, or other trail hazards involved while traveling under these conditions. Fortunately a two-way radio set, which had been installed in the machine a few weeks before, was used to contact the base station and to advise them of the trouble. A new track was dropped by airplane nearby. Repairs were made and the survey was successfully completed.

Electronics has been used to provide the solution to many problems in many fields. In the field of snow surveys, there is little question that electronics can be used to obtain more information at a more economical cost. Along with this, it should make the lot of the snow surveyor a little easier.

RED CLOVER—THE OLD RELIABLE

By E. A. HOLLOWELL

No. 45

This is the forty-fifth of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.

RED clover, the legume of many uses for many places, is still one of the best. After more than 250 years of use, it holds a firm position in good farming in the humid northern sections of the U. S. for hay, pasture, silage, and soil improvement. In the South and West its use is increasing. Its prestige has been enhanced by recent improved varieties.

There are good reasons for red clover's continued and extensive use. Pasture-renovation tests and farm experiences have shown that under cool humid conditions it surpasses all other legumes in the rapid, consistent establishments of good productive stands under wide extremes of soil conditions and fertilizer treatments. It develops good stands when seeded with different companion crops and in mixtures with other legumes.

Red clover has many deficiencies, the most serious being its failure to withstand long summer droughts and its tendency to succomb to repeated periods of freezing and thawing during early spring.

Red clover is a perennial plant that may behave as a winter annual or a biennial. Diseases, insect pests, unfavorable weather, and improper management, alone or in combination, may lead to its premature death. New varieties, resistant to diseases and insect pests and tolerant to unfavorable weather, should reduce farm losses. However, new varieties will not make satisfactory crops without proper nutrition, management, and culture. All these requirements must be met to obtain the potential value of red clover.

Note:—The author is head, clover section, crops research division, Agricultural Research Service, Beltsville, Md.

It is surprising how red clover will respond to good treatment. While it will grow in slightly acid to medium acid soils, it benefits from the use of limestone. Phosphate and potash are two important fertilizers that red clover must have to make good growth. Fertilizers having ratios of 0-1-2 and 0-1-3 are giving greater red clover yields on many soils where, in the past, an 0-1-1 mixture was thought to be adequate. An increase in the rate of fertilizer often results in greater yields.

Fertilizer residuals from application on winter wheat in the fall, may not be enough for good growth of spring-seeded red clover on the same field. Many farmers apply additional fertilizer, especially phosphate and potash, in late winter or early spring.

Another extremely important factor in getting good, persistent stands is date of seeding. Seedings made in late February or the first 2 weeks in March have given far better stands that persist during hot, dry periods of the summer than later seedlings.

The summer of 1957 was the driest on record for the Eastern Shore of Maryland. Much of the corn failed to produce more than small nubbins. A stand of Chesapeake red clover seeded in late February on winter wheat survived the summer drought even with the competition of a 30-bushels-per-acre wheat crop. While the Chesapeake variety may have some drought-resistant characteristics, the early establishment of the stand and good growth during the cool months of spring favored plant survival during the long, hot dry summer.

Basic research on the effect of different temperatures on growth and survival of red clover has shown that high temperatures favor the depletion of root reserves, leading to seedling starvation. Date-of-seeding tests have also shown the value of early seeding in getting and maintaining good stands.

In the deep South more red clover is being used every year. There, it behaves as a winter annual. It is planted from October 15 to December 1, the date depending on location. If red clover is planted in a perennial grass turf, the grass should be closely grazed or clipped and fertilized. Many farmers are effectively using sod seeders which open up the turf, a

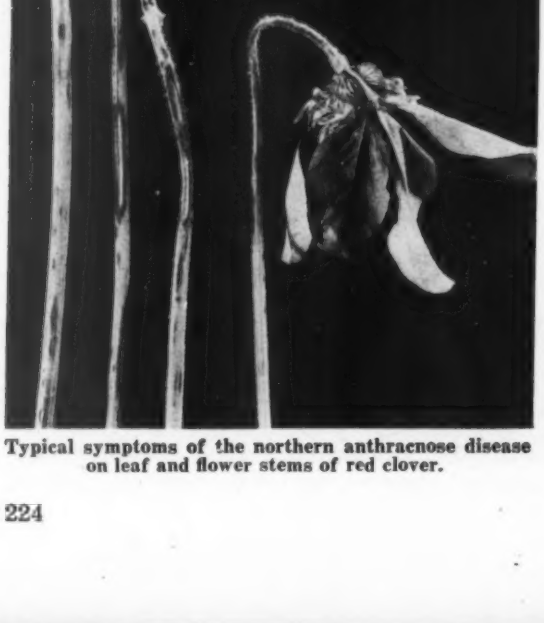
On experimental plots near Beltsville, Md., the Kenland variety of red clover proves to be superior to Cumberland.

condition that favors the seedling establishment.

In the deep South red clover will produce an abundance of grazing and can be used for hay or silage before the stand dies during the middle of the summer. It should not be grazed as closely as whiteclover or Persian clover. Rotation grazing is more desirable than continuous grazing. If one of the southern varieties, such as Nolin or Port Gibson, is used, and if it is allowed to set seed, a good volunteer stand can be obtained.

While red clover has been widely used in the Rocky intermountain region under irrigation, particularly for seed production, its potential for forage has not been realized because irrigation has been improper. The same situation exists in the area along the Pacific Coast. Irrigation practices for alfalfa have generally been followed. For yields ranging from 5 to 7 tons per acre, red clover requires more frequent irrigation with a smaller quantity of water. However, the total water requirement of red clover is about the same as that of alfalfa.

Diseases play an important role in yields, in stand persistency, and in hay quality. All parts of the plant are subject to diseases. Diseases fluctuate in occurrence and intensity with weather conditions that affect the development of the disease-producing organisms and with the susceptibility of the host.



Typical symptoms of the northern anthracnose disease on leaf and flower stems of red clover.

The fact that red clover has been a major legume for such a long time attests its virtues in spite of its susceptibility to disease and insects. Breeding for disease resistance is the best method of control. Basic research on the organisms causing diseases is essential before a good job of breeding for disease resistance is possible. After the organism has been studied, the next step is the development of screening procedures by which literally thousands of plants are subjected to inoculation under conditions favorable to development of the disease or diseases. The plants that show some resistance are selected and intercrossed, and their progeny inoculated in turn. It is generally necessary to repeat this procedure for many generations before a high degree of resistance is obtained while other desired characteristics are maintained. The Kenland variety has high resistance to southern anthracnose, while Dollard is highly resistant to northern anthracnose. Two new experimental varieties, as yet unnamed, are highly resistant to powdery mildew, and one of them is resistant to northern anthracnose. Resistance to other diseases is being studied as rapidly as facilities permit.

There are two particularly destructive insects that shorten the life of red clover. These are the red clover root borer and the clover root curculio. There are no varieties resistant to either of these insects, which take their toll unless controlled by the use of insecticides.

Pennscott, Dollard, Kenland, Chesapeake, Nolin, and Port Gibson, are red clover varieties that have been widely tested by State agricultural experiment stations. One or more of these have been found to be best adapted to specific States or parts of States and are being recommended over common red clover.

For better red clover: (1) use the variety recommended by your State agricultural experiment station; (2) follow the recommended liming and fertilization practices; (3) in the North seed early in the spring, and in the lower South seed in the fall; (4) clip and remove grain stubble and weeds during the summer; and, (5) treat stands with insecticides to control insects. Good red clover responds to good treatment.

Stone Wall Removal Pays

By LESTER FOX

FROM the rockbound coast of Maine to the gentle hills of New Jersey, farmers are busy removing stone walls from their farms. Romantic relics of a bygone era, the stone walls stand in the way of modern farming. Farmers who have removed their stone walls report these benefits:

(1) Acreage gain. For every 1,000 feet of stone wall removed, they gain about an acre of land worth $200 to $500.

(2) Conservation made possible. With the stone walls removed, they can put in conservation measures not possible with the farm cut up into small fields. Some of these measures, like contour strips and diversion terraces, stop soil loss and conserve water.

(3) Increased production. The larger fields permit better all-round farming. That adds up to larger per-acre yields.

(4) Cheaper and better use of power equipment. Less turning and maneuvering. No up and down hauling—mostly on the level.

(5) Elimination of soil sapping growth of brush and trees in the stone walls.

It costs about $200 to remove 1,000 feet of stone wall. The ACP helps pay the cost. The farmer usually contracts the job. Several well-equipped contractors do farmwork almost exclusively. The work is laid out, including a conservation plan, by Soil Conservation Service technicians after the farmer signs an agreement with his soil conservation district to carry out the plan.

Most of the stone walls are so old they have broadened as they have crumbled. So they take up more space than when first built. Besides, trees and brush have grown up in nearly all of them. So they are sometimes called "hedgerows" or "stonerows." The trees and brush take needed water from the farmer's crops, and they shade the land along the wall. So, they further cut down on the farmer's production.

Note:—The author is information specialist, Soil Conservation Service, Upper Darby, Pa.

Lots of northeast farmers have not yet got around to removing their stone walls. But many of them have, and most of those who have are now all-out for stone-wall removal.

Take Oscar Unangst, young dairy farmer in the Warren County Soil Conservation District near Belvidere, N. J. He had 110 acres that stone walls split into 9 fields. Two of them were 4-acre fields shaped like triangles—hard to work. Many walls ran up and down the slope. The rain raced down the fields along the walls. The racing water gullied the fields. It spilled over into his farm road, keeping it in bad condition. Unangst couldn't put in any erosion-control measures because the fields were too chopped up.

Four years ago Unangst started taking the stone walls out. He has picked up 9 acres of productive land. He has only two fields now. When he pulls out the last stone wall, he will gain three more acres and have only one field.

With the stone walls gone, Unangst was able to start work on a soil and water conservation plan. He has put his land in contour strips. The

Stone walls cut this New Hampshire farm into many hard-to-work fields.

Oscar Unangst looks over a pile of stones that once divided his farm into nine small fields.

rain now soaks into the soil where the plants can use it. The gullies are gone. His fertilizers no longer wash out with the soil. Crops are doing better, and quantity and quality are both up.

"I hope I'm not exaggerating, but I honestly expect a 200 percent increase in production," Unangst said.

"We're fertilizing a little heavier than we used to. We can afford to now because we're getting full value from it. It isn't being washed away anymore.

"Before, we couldn't crop much of the upland. We just let the cattle run in there and get what they could out of it."

"Production? We're now averaging twenty 10-gallon cans of milk a day year-round," Unangst said. "We used to average 13 or 14. We've been improving our herd and that accounts for some of the gain. But my new way of farming accounts for most of it.

"The way it used to be, in the spring when the pasture was good, milk production was good. But along in July and August and part of Sep-

Verne Clifford (left), his son Frank, and Donald K. Wolff SCS technician look over the contour stripped field that was made possible by removal of stone walls that once cut the expanse into many small fields.

tember, when the pasture wasn't so good and we had no silage, the cows didn't do so well. Now in those months, we have green chop and silage. All of our excess green goes into the silo. In fact, we have green feed the year around.

"As far as our contour strips go, I would never change. Each year since I put them in they've been doing better. The soil is working up better and production is still improving."

Verne Clifford is another northwest New Jersey farmer who has become a convert. With his son Frank he owns a 112-acre dairy farm near Delaware, N. J. When he finally decided in 1955 to clear his farm of stone walls, he wasn't sure it was the right thing to do. Now he says he's sorry he didn't start sooner. "I'd be way ahead if I had," he said.

Take the case of George E. Brown, East Corinth, Maine. He operates a 280-acre dairy farm. He had 30 acres that stone walls cut up into 8 small fields. His sloping land of Thorndike silt loam soil was eroding. The small fields hindered his operations. He could not put in the strips he needed to stop erosion. He was equipped with power machinery but his fields were laid out for horse and buggy days.

So Brown removed the stone walls. He gained 7 acres. Now he has one large field instead of eight little ones. He has been able to put in strips of corn, grain, and hay. The strips help control erosion. No more topsoil going down the drain. And, now he can operate his power equipment at less cost with greater efficiency.

Philip Worthen of Exeter, Maine, gave his farm a facelifting by removing 2,100 feet of stone wall. He made three fields into one and picked up 2 acres.

With the farm set up for conservation farming, Worthen handles his operations more efficiently and economically. He doesn't have to worry now about his Bangor and Thorndike silt loam soils eroding.

Herbert Smith of Lincoln, Maine, is a potato farmer. His farm consisted of 8 fields with 96 acres of tillable land. The fields were separated by 5,100 feet of stone wall. The farm was located on a hillside. Its soil is Bangor silt loam, Penobscot County's best potato soil. Soil erosion was taking its toll. It was hard to control in the small fields.

Grown up in weeds and brush, this stone wall occupies valuable acreage on a Maine potato farm. It also prevents the use of proper conservation measures that might stop the runoff and erosion.

Smith removed the stone walls, built 7,300 feet of diversion ditches and put in contour strips. He gained 6 acres. He rotates potatoes with a winter rye cover crop, grain, and hay. All fields operate from a centrally located farm road. Crop rows are much longer, more economical and efficient to operate. Crop yields are on the increase.

Smith is now one of Penobscot County Soil Conservation District's outstanding conservation farmers. His conservation work won him an all-expense 10-day vacation at the Goodyear ranch, Litchfield Park, Ariz.

TWENTY-NINE YEARS OF FRIENDSHIP.—For 29 years farmers of New Haven County, Conn., and members of the Wallingford Rod and Gun Club have been friends. Now both are benefiting from that friendship, and they expect the benefits to increase as farmland affording hunting and fishing decreases and the need of encouraging wildlife on the remaining farmland increases.

In 1930, founders of the rod and gun club invited the county's farmers to a dinner as a friendly gesture. Every year since then the club has been dinner host to the farmers. Nowadays the dinner is held in March at the Wallingford Grange Hall. Fish and game officials, the featured speakers, keep both the farmers and the

sportsmen informed on wildlife matters. They usually have something helpful to say about farmer-sportsman relations. Most of the farmers attending now are cooperators with the New Haven County Soil Conservation District.

"We didn't have this in mind but our friendly relations with farmers have helped our club members a lot," said Julius Toth, former president. "Our farmer friends don't hesitate in opening their land for the use of our hunters and fishermen. They know from our friendship that they can depend on our club members to use good outdoor manners and to respect their privacy and property. In these days, when places to hunt and fish are getting scarcer all the time, our club appreciates the friendship of our farmers all the more."

The farmers also help the club members by including wildlife-encouraging measures in their soil and water conservation plans. The club furnishes farmers with bicolor lespedeza and evergreens for wildlife plantings. Members help farmers plan wildlife areas. The club also stocks birds on the farms.

As a district cooperator, the club itself practices soil and water conservation on the 3,000 acres it owns.

"We're all working together, doing our best to conserve our wildlife resources," Toth said.

—THEODORE W. PAWLOWSKI

DISTRICT PROFILE

N. H. G. BALFOUR of NORTH CAROLINA

IN the year 1884, a young civil engineer just out of Edinburgh University left his native Scotland for Westport, New Zealand. George Goldie Balfour and his young wife had high hopes as they landed in this remote part of the British Empire. He had been commissioned to build the harbor works in this fast-growing seaport town. They established a home and settled down. Napier Humphrey Goldie Balfour was born in 1890. He was later to become one of the outstanding soil conservation district supervisors in North Carolina.

N. H. G. Balfour.

When young Napier was 6 years old his father and mother decided to go back to Edinburgh where the children could get an education. George Goldie Balfour had long been close to Edinburgh University. His father, John Hutton Balfour, had been a professor of Botany there. Also a brother, Isaac Bayley, who later became Sir Isaac Bayley Balfour was a professor of Botany. This uncle of young Napier was later named King's Botanist to Scotland and Keeper of the Edinburgh Botannical Gardens.

Young Napier Balfour attended Rutherford College at Newcastle-On-The-Tyne. About this time T. K. Brunner, the commissioner of agriculture for North Carolina, made a trip to Scotland to see his old friend Edward Bayley Balfour, a great-uncle of Napier. He told of the agricultural possibilities in North Carolina and persuaded young Balfour and several other Scottish lads to emigrate to America.

Napier left Scotland at the age of 17 to come to North Carolina. He found work on a truck farm near Lumber Bridge for $10 a month and board. He worked there for 18 months and then went to Wisconsin where he worked on a

farm and attended the University at Madison for 1 year.

He later spent some time in Michigan. But he still recalled the warm southern climate and returned to the South in 1917. Soon, he was drafted into the U. S. Army and after brief training was sent overseas. He took part in several major engagements, served with the Army of Occupation on the Rhine, and was discharged with a sergeant's rating.

Upon his return to North Carolina he worked for awhile with Prof. Earl Hostetler, head of the animal industry department at N. C. State College. But many generations of Balfours had worked close to the soil and he was no exception. So, again he came to Lumber Bridge. This time he purchased a part of the Malloy Brothers farm.

In 1931 he married Victoria May Greenfield, who worked as a governess for the British legate in Washington. Mrs. Balfour, although born and reared near London, quickly became accustomed to life on the Hoke County farm. During the depression years the struggle was hard to keep the farm going. Gradually, however, this couple added to the original land until today they have 525 acres, of which 374 is in cultivation and pasture. Incidentally, the farm is named Inverleith after the ancestral home, Inverleith House in Edinburgh.

In 1942, when there was talk of organizing the Pee Dee-Cape Fear Soil Conservation District, Mr. Balfour was one of the leaders. Soon after the district started operations he was elected supervisor and has served continuously for over 15 years. Last year he was elected chairman and has been very active in the formation of a watershed project along the Lumber River.

Like his illustrious second cousin, Lord Arthur J. Balfour, British Prime Minister, 1902-1905, Mr. Balfour has been interested in politics. He has served as Hoke County commissioner for 25 years—10 years as chairman. In 1942, he was elected president of the North Carolina association of county commissioners and served for a 1-year tem.

Three years ago he decided that he had served his county long enough as a commissioner and declined to run again. He has turned the operation of the farm over to his son, John, and now he and Mrs. Balfour have time to do some of the things they have always wanted to do. One of these is a trip to London and Edinburgh. He is still vitally interested in soil and water conservation and wants to continue to serve as a district supervisor as long as he is able.

The 3.2-acre tobacco allotment on the Inverleith farm was placed in the Soil Bank last year and today only general crops such as corn, small grain, cotton, and soybeans are grown. The largest acreage is planted to corn. A herd of approximately 125 Aberdeen-Angus cattle is kept the year around. Mrs. Balfour has always insisted on having a few sheep on the farm so this is one North Carolina farm on which sheep can be seen grazing the green pastures. A comparatively new venture is 1,500 laying hens.

—W. O. LAMBETH

Great Plains Program Aids Small Rancher

By H. G. HILPMANN

"IT looks good to me. How soon can I get started?" That was Fred Walker's reaction after the Soil Conservation Service staff member explained how the Great Plains Conservation Program (Public Law 1021) would help with his ranching problems. Walker's statement is in contrast to that made by some who have thought the Great Plains Conservation Program would be of little benefit to small operators. His ranch unit is small by comparison with some other layouts in the area.

Walker's "spread" is about 8 miles north of Fort Laramie in Goshen County, Wyo. The practices involved in a soil and water conservation plan were not new to Fred Walker. His father, Dwight, had developed such a plan back in 1947 as a cooperator with the Lingle-Fort Laramie Soil Conservation District. That plan called for seeding of rangeland, building stock water dams, installing a water-spreading system, and planting a windbreak. Various factors, such as drouth, severe winters, storms,

Note:—The author is soil conservationist, Soil Conservation Service, Torrington, Wyo.

wind, and fluctuating markets had slowed the conservation job. And, there was the matter of expense, too.

When Fred took over the ranch after the passing of his father, there was still a lot to be done. Since the ranch is small, it is used primarily to winter cattle. Fred saw the need for better winter grazing. Range condition varied from good to poor. The windmill near the ranchhouse didn't furnish adequate water for cattle in the pastures. There was another item: Cattle need hay in winter, and the ranch was producing no hay at all.

There were some problems all right. But Fred could see that the provisions of the Great Plains Conservation Program were geared to minimize them. His application to participate in the program was the fifth in the Lingle-Fort Laramie district.

As any other Wyoming cattleman, Fred knows grass is the best productive cover he can have on his land, and erosion won't take place under good grass cover. About 200 acres on the ranch were dryfarmed when he was a boy. This land was later seeded to crested wheatgrass. The grass is now very sparse, and is dominated by sand dropseed and curlycup gumweed, not a very desirable combination from the forage standpoint.

Fred Walker prepares to mount the grader used in constructing spreader dikes and ditches.

Fred's Great Plains conservation plan, which he developed with SCS technicians' help, brings the original conservation program up to date. It will enable him to reseed about 180 acres of this land to native grasses. When established, the new grass will give more and better winter grazing, and relieve the "pressure" on the balance of his grazing land.

A dam, intended for water spreading in one of the pastures, was built 15 or 20 years ago. It failed, due to improper design. Investigation by SCS technicians showed reconstruction to be impractical. It was found that a system of spreader dikes and ditches would require less work and would control two to three times as much water as the former dam. Twenty-five to thirty acres of hayland will be developed with the benefit of the spreader system.

Fred is a good road-grader operator, a job that he handles part time for the school district. In his part of the country, the school district helps maintain roads traveled by the school buses. He figures he will be able to negotiate with the district to use the grader to do part of the dike and ditch construction himself.

The large north pasture will be fenced to divide it for better grazing management, and a stock-water dam will be built in the east half. A well and storage facility will furnish stock water in the west half.

A farmstead windbreak is essential for most people in these parts. Fred's place doesn't have one—as yet. But with provision in the Great Plains Conservation Program for helping a man establish trees, Fred says this is a bet he won't pass over. He will put in a 2-acre L-shaped windbreak around his ranch headquarters.

Developing a conservation plan for the ranch was a relatively easy job. Fred knew what the place needed, and where he wanted to start. In fact, SCS technicians advised him to at least hold off until his contract was approved and signed before he started work.

The amount of his own money involved in the 5-year plan is small in relation to the conservation that will be applied. His main contributions will be his own labor and good grazing management of the entire ranch. The cost shares to be paid by the Federal Government will amount to 80 percent of the county average cost of installing such practices as reseeding and water spreading.

Fred comented, "I like it because the cost sharing is set up for the whole 5-year period. I can run my cows on that grass too, after it's established." He also knows that he can proceed with his plan ahead of schedule if he's able, and he can receive the cost share as soon as each practice is satisfactorily completed.

The Walker Ranch is in the 25,000-acre Pine Ridge-Case Bier watershed, in Goshen County, which is receiving Federal assistance for flood prevention. Fred is carrying out a job of protecting and improving soil and water resources —his own land and the watershed—through a Great Plains program for both the small and large operator.

4-H CONSERVATION AWARD WINNERS.—Eight 4-H Club boys won a $400 scholarship in the 1958 Firestone Tire and Rubber Company soil and water conservation contest. Here they prepare to cut a big cake. (Left to right) Raymond C. Firestone, president of the company; Wayne Anderson, Rush, Colo.; Charles B. Keller, Palmyra, Mo.; Roger Sorenson, Fallon, Nev.; Michael J. Persons, Amsterdam, N.Y.; Bob York, Hitchcock, Okla.; Clarence W. Wallace, Staunton, Va.; Clint Birkenbaugh, Kingman, Kans.; and Ray Dunlap, Jayton, Tex.

Browntopmillet—

—A Multipurpose Grass

By PAUL TABOR

A visitor riding through Georgia in late summer can see numerous fields of an unusual grass. Cattle will be grazing in some, hay baling will be taking place in others, and combines will be busy harvesting seed in quite a few more. Doves will be swarming over many fields and quail feeding along the borders next to thick cover. A few months later, the same grass may be found near many ponds to attract wild ducks.

The grass is browntopmillet (*Panicum ramosum*) a native of India. It is an old grass there but a relatively new one in the United States. The noted botanist Linneaus secured seed from India nearly 200 years ago and grew plants in his garden at Upsula, Sweden. Seed was brought into the United States about 1915 and distributed under the name, German hay grass. I have been unable to learn who introduced it and why it had that common name.

One of the early growers was the late E. M. Bohler of Statesboro, Ga. According to his son C. O. Bohler, a 2 pound package of seed was bought in 1916 from some seedsman, probably the late N. L. Willet of Augusta, Ga. It was planted in rows and cultivated. The son was assigned the chore of keeping the doves from the small planting as seed matured. Neighbors were impressed with its growth. They obtained seed and were growing small areas near their barns in 1917 when I first saw the crop.

During World War I, an effort was made to change the name to Liberty grass. Soon after the war a specimen was incorrectly identified

Note:—The author is plant materials specialist, Soil Conservation Service, Athens, Ga.

Browntopmillet ready for seed harvest.

as a variety of browntopmillet, an American species with reddish brown seed at maturity. Browntopmillet became the common name of this foreign grass as it spread over Georgia. When the correct botanical identification was learned about 20 years later, the common name was established so well that a committee for Standardized Plant Names decided to retain it and change the common name of the original browntopmillet (*Panicum fasciculatum*) to browntop panicum.

Soon after 1920 the center of seed production for browntopmillet gradually shifted to central Georgia. George Berry of Crawford began growing it in 1921 and has produced seed each year since. He has found the demand irregular. Now a cooperator with the Brown River Soil Conservation District, Berry has found browntopmillet to be one of his key conservation crops, furnishing soil protection as well as grazing, hay, and seed. Some of his neighbors have used it for silage and for hog grazing.

With hot weather, adequate moisture, and a rich soil, browntopmillet is a fast-growing grass of good quality. It covers the soil quickly, producing a moderate yield of forage and a high yield of seed. It is used in a 1-year rotation with annual cool-season crops such as crimson clover. This rotation was developed near Athens, Ga. on the Sandy Creek Erosion Demonstration Project in 1935. It is now used on many farms. Usually rye or oats and ryegrass are planted with the crimson clover. This mixture produces a good temporary sod and efficient winter grazing.

Tom Scott, Jr., a SCD supervisor of Forsyth, Ga., has about 1½ acres of crimson clover and ryegrass for each milking cow. He fertilizes it well with 500 to 600 lbs. 4-12-12 per acre and topdresses with 50 to 60 lbs. nitrogen per acre in the spring. When seed of the reseeding crimson clover mature, the field is disced and browntopmillet sowed for hay. After several years of this rotation the millet does well with only 16 lbs. N. per acre each year. On one field now in the 8th year of this rotation, he has secured seven successive volunteer crops of crimson clover and browntopmillet with partial stands of ryegrass. Prompt discing after each seed crop matures is necessary.

Mr. Scott formerly used annual lespedeza for hay but found it too late and too moisture-exhausting for a grazing crop the following winter. He said: "Browntopmillet is better for me. My cows will eat the hay in preference to lespedeza hay and they will graze it in preference to Starr millet. The hay is slow in curing."

A field of browntopmillet almost ready for seed harvest.

Five dairymen of Morgan County, Ga., all district cooperators, have given their opinions of browntopmillet. "I like it", said Bob Newsom, a partner in a local dairy. "I graze about 40 acres with 80 milking cows from late May to September and have an abundance of feed if good rains come."

"It's good grazing and hay," reports E. G. Stewart, of Madison. "I've been sowing it for 5 years. I use at least 500 lbs. of 4-12-12 at planting. I find the millet ripens too fast some years."

"It really paid off this year," according to John Charles Maddox who grazed 75 cows 1 hour per day from July 1 to September 10, 1958 on 25 acres and cut 1,200 bales of hay from the surplus growth. "I will plant it again next year."

Two dairy partners, Messrs. Thomas and Bennett of Madison, Ga., are not sold on it. They have never grown any but have observed it on a neighbor's farm and have found it difficult to bale. Their estimate of its value is, "too short a season of growth and too low in yield."

Browntopmillet on this poor soil makes scant growth except in spots where manure was dropped by grazing cattle.

About 100 thousand acres of browntopmillet are grown in Georgia, each summer. There has been a gradual increase since its introduction. Other States have not used it so extensively, but in some places its use is expanding rapidly.

Elmore County, Ala., a few miles northeast of Montgomery, is an example. In 1954, 100 lbs. of seed were sowed on 6 acres by district cooperator C. W. Gantt of Titus, Ala. In 1958, about 75 tons of seed were sowed on 5,000 acres by farmers in the county. More than 100 tons of seed have been saved for 1959. It has grown from an unknown grass to a well-known crop in 4 years.

Recently Mr. Gantt said, "We like browntopmillet. It's the only kind of hay now made on my farm except a little small-grain hay. We grazed a field last summer and the cows preferred it to our well-fertilized pastures of Dallisgrass and Bermudagrass. The seeds are good bird feed. We have several extra coveys of quail now because of it."

Another SCD cooperator, T. L. Crowder, of Eclectic, Ala., sows a mixture of 3 parts browntop to 1 part of Starr millet, an improved variety of cattail or pearlmillet. He reports, "I have used this mixture 2 years and will use it again next year. It is better than either millet alone. In the favorable year 1958, I grazed 40 cows for 60 days on 8 acres sowed to this mixture. I also use browntopmillet for hay. The cows will leave good crabgrass hay for it."

Another SCD cooperator, J. H. Nolan, also president of Elmore County Farm Bureau, observed: "With adequate moisture it is the answer to summer grazing, being the fastest growing crop I've used. I plant about an acre per milking cow for grazing and hay. I also plant separately, ¼ to ⅓ as many acres to Starr millet for grazing."

J. C. and J. R. Johnson, of Wetumpka, Ala., are growers and custom harvesters of browntopmillet hay. "A good hay crop," is their estimate of it. "It is sometimes cut too green to cure well before baling. The green seed are the slowest to dry out. It has volunteered heavily in a few fields and interfered some with the next crop."

Cooperator Charles P. Storrs, formerly SCS agronomist, evaluated it as "our best hay crop, except for possible pest qualities, and a mighty good dove feed."

Another SCD cooperator, banker A. J. Noble of Tallasee, Ala. reported, "I like it very much. It makes good grazing, excellent hay, and lots of seed."

DISTRICT PROFILE

HENRY ALLEN BOONE of MISSOURI

HENRY ALLEN BOONE of Caruthersville, Mo. is now serving his 14th year as a supervisor of the Pemiscot County Soil Conservation District. He has served one term as director of the Missouri Association of Soil Conservation Districts.

Mr. Boone was born in 1881, at Boone, Colo., a town named after the Boone family. He is a direct descendant of Daniel Boone. "Henry", as he is known by his friends and neighbors, is a man of wide interests and much understanding. He grew up in the West but has lived in Pemiscot County for the past 41 years.

Mrs. Boone was raised in Pemiscot County, and taught school in Colorado where they met.

Henry A. Boone.

While back on a visit to his wife's former home years ago, Mr. Boone, who was in the livestock business in Colorado and had never farmed, noticed a Southeast Missouri Chamber of Commerce agricultural exhibit in the St. Louis Union Station. Upon questioning the attendant he learned that most of the exhibit material came from near Hayti, Mo. in Pemiscot County.

On this trip he bought his first 40 acres and stayed on to become one of southeast Missouri's outstanding citizens. At that time Mr. Boone says cotton was selling for 6¢ per pound in the seed. Chopping hands were paid $1 a day and cotton pickers 50¢ per hundred pounds. He said you could produce cotton in those days for $15 to $20 per bale, and clear over $100 per acre on some of the rich land of Pemiscot County.

When the Pemiscot Soil Conservation District was established he was elected as one of its first supervisors and immediately became interested in learning more about the soil conservation problem in Pemiscot County as well as the whole Nation. Up until a few years ago he loved to travel and in his travels never failed to look up soil conservation district supervisors and SCS work unit people. As a result he has visited soil conservation districts in Arkansas, Colorado, Illinois, Florida, Utah, New Mexico, Arizona, and Nebraska. He says, "I enjoy visiting and talking with soil conservationists and other conservation-minded folks. I like to swap ideas and to see how they carry out their work."

Henry Boone's record of attendance at State, national, and local soil conservation district supervisors meetings is almost 100 percent. If he happens to miss a supervisors' meeting, or any other, you can well know there is a good reason behind it; a prior commitment or ill health. He says, "My soil conservation district activities are important to all of us. I like to know that I've done my best in serving as a supervisor in one of the many soil conservation districts throughout the country."

Pemiscot County is well-known for its cotton production and fertile soils. Mr. Boone, like all the district cooperators, places particular emphasis on his cotton crop. However, in addition to his production of cotton, corn, oil soybeans, and alfalfa, he maintains a herd of polled Hereford cattle along with plenty of improved pastures that he rotates.

He claims he is fortunate in many ways; the fact that he married Minnie Speer of Braggadocio, a small town in Pemiscot County, in 1915, is one of his good fortunes. Mrs. Boone, now retired from the teaching profession, is busy with her garden and house, and is equally interested and devoted to the teaching of soil and water conservation.

It has been a long time ago since Henry Allen Boone was selling fat cattle on the Denver market and feeders in Kansas City, but he is still selling the soil conservation district movement throughout the State of Missouri.

—HARRY B. BARKER

MORE BEEF CATTLE, LESS MILK COWS.—On January 1, 1959, there were about 96.9 million head of cattle in the United States, according to the Crop Reporting Board. This was about the same number as on January 1, 1956, the highest previous record. The number of milk cows was down to about 21.6 million, the lowest since 1921. The number of beef cattle is the highest ever.

The reports also show that milk production per cow is about 5 percent higher than ever before during midwinter.

Career Service Award

LYLE T. Alexander, chief of SCS's Soil Survey Laboratories at Beltsville, Md., was one of 10 government employees to receive the National Civil Service League's Career Service Award for 1959. The presentation was made at a special dinner on March 2 , at the Sheraton Park Hotel, Washington, D. C.

Lyle T. Alexander.

Dr. Alexander, a world leader in soil science, was the only USDA employee to be so honored this year. He was cited for his expert use of radioactive materials in agricultural research, and for his advice to the Atomic Energy Commission on the effects of radioactive fallout on soils, on plants grown in these soils, on animals contacting such soils and plants, and the exposure risks to people walking over these soils.

He joined the USDA as a junior soil physicist after graduating from the University of Arkansas in 1928. In 1935 he received his Ph.D. in chemistry at the University of Maryland. In 1953 and 1956, respectively, he received USDA's Superior Service and Distinguished Service Awards.

SOIL STEWARDSHIP WEEK.—For the fifth consecutive year, soil conservation districts are sponsoring Soil Stewardship Week. The 1959 observance begins Sunday, May 3, and continues through Sunday, May 10.

To help districts gain the widest possible observance of this occasion, the NASCD is again offering booklets, church programs, and posters at low cost.

—NOLAND J. FUQUA,
Former President,
NASCD

FEWER FARM WORKERS.—During the week of January 18-24, 1959, there were 5,269,000 farm workers in the United States, according to the Crop Reporting Board. This was the smallest number since records were started. About 4,351,000 were family workers, while 918,000 were hired workers.